

**Amendments to the Specification**

Please replace paragraph [0007] with the following rewritten paragraph:

**[0007]** A method for observing high-altitude neutral air comprises the steps of:

discharging ion particles so as to be ~~trapped~~influenced ~~with-by~~ magnetic field lines of the earth,

colliding the ion particles with high-altitude neutral air to generate high velocity neutral particles through charge exchange, and

detecting the high velocity neutral particles, determining the distance to the high-altitude neutral air from at least one of the discharge position of the ion particles and the detected position of the high velocity neutral particles based on the period of time between the discharge of the ion particles and the detection of the high velocity neutral particles, thereby determining both the direction of the high-altitude neutral air based on the direction of the high velocity neutral particles and the spatial position of the high-altitude neutral air.

Please replace paragraph [0008] with the following rewritten paragraph:

**[0008]** In an exemplary embodiment, a given ion source is disposed in earth orbit and ion particles are then discharged from the ion source so as to be ~~trapped~~influenced by the magnetic field lines of the earth. When the ion particles collide with the high-altitude neutral air, high velocity neutral particles are generated through charge exchange with the ion particles. The high velocity neutral particles travel inertially without being disturbed by the magnetic field lines of the earth, and are detected with a neutral particle analyzer disposed in the orbit around the earth.

Please replace paragraph [0018] with the following rewritten paragraph:

**[0018]** The ion particles may be discharged in pulse or modulation. In this case, the

discharging ~~timings~~ time of the ion particles and the ~~trapping~~ time of measurement ~~timings~~ of the high velocity neutral particles can be recognized clearly, and the distance for the high-altitude neutral air can be measured easily and precisely.

Please replace paragraph [0020] with the following rewritten paragraph:

[0020] This invention will be described in detail with reference to the accompanying drawings.

Fig. 1 is an exemplary method for observing high-altitude neutral air according to the present invention.

In Fig. 1, an ion cluster source is disposed as an ion source on the orbit above the equator of the earth, and a neutral particle analyzer is disposed in the rear side of the ion cluster source. Ion particles are discharged from the ion cluster source, and ~~trapped~~ are influenced ~~with~~ by the magnetic field lines generated from the axis of the earth. In this case, the ion particles are rotated along the magnetic field lines, which is defined as “Larmor motion”, and moved north and south. If a given condition is satisfied, the mirror confining mechanism is generated, so that the ion particles are moved repeatedly north and south.

Please replace the Abstract with the attached substitute Abstract.